WHAT IS CLAIMED IS:

1.   A method of link adaptation and code space management comprising the steps of:

encoding original transmission bits into initial turbo encoded symbols;

storing the initial turbo encoded symbols;

interleaving and transmitting the initial turbo encoded symbols;

determining the number of Walsh codes available for a desired user and a modulation and coding scheme (MCS) level according to carrier to interference (C/I) feedback values from a desired mobile station;

determining rate matching factors corresponding to the number of available Walsh codes and the MCS level;

selectively puncturing or repeating the stored turbo encoded symbols based on the rate matching factors; and

re-transmitting the turbo encoded symbols subsequent to selectively puncturing or repeating the turbo encoded symbols.

2.   The method according to claim 1, further comprising the steps of:

receiving the transmitted initial turbo encoded symbols and the re-transmitted turbo encoded symbols subsequent to selectively puncturing or repeating the turbo encoded symbols;

re-deriving the rate matching factors in response to the number of code channels and MCS level of current re-transmissions and the initial transmission;

selectively de-puncturing or de-repeating the received turbo encoded symbols based on the re-derived rate matching factors; and

coded symbol combining the selectively de-punctured or de-repeated turbo encoded symbols.

3.   The method according to claim 2, wherein the step of coded symbol combining comprises full or partial symbol combing.

4. The method according to claim 2, wherein the step of coded symbol combining comprises Chase combining.

5. The method according to claim 2, wherein the step of coded symbol combining comprises Incremental Redundancy combining.

6. The method according to claim 1, wherein the step of storing the initial turbo encoded symbols comprises storing the initial turbo encoded symbols in a hybrid automatic re-transmission request (H-ARQ) memory.

7. The method of link adaptation and code space management according to claim 1, wherein the step of encoding original transmission bits into initial turbo encoded symbols comprises selectively turbo puncturing or avoiding puncturing of the original transmission bits to generate an encoded packet (EP) having the lowest code rate required by a desired incremental redundancy (IR).

8. The method according to claim 7, further comprising the step of determining the radio frame length according to a resource management algorithm.

9. The method according to claim 8, wherein the step of determining rate matching factors corresponding to the number of available Walsh codes and the MCS level further comprises determining the rate matching factors corresponding to the radio frame length.

10. The method according to claim 9, wherein the steps of interleaving and transmitting the initial turbo encoded symbols comprise:

generating a sub-packet (SP) from the EP based on the rate matching factors for this initial transmission; and

transmitting the SP.

11.   The method according to claim 10, wherein the steps of selectively puncturing or repeating the stored turbo encoded symbols based on the rate matching factors and re-transmitting the turbo encoded symbols subsequent to selectively puncturing or repeating the turbo encoded symbols are replaced by the steps of determining a new set of rate matching factors according the MCS, number of Walsh codes, and radio frame length in response to an unsuccessful SP decoding signal via an acknowledge channel from a receiver; determining a new SP based on the new set or rate matching factors; and re-transmitting the new SP.

12.   The method according to claim 11, further comprising the steps of:
        receiving the transmitted initial SP and the re-transmitted new SP;
        re-deriving the rate matching factors in response to the number of code channels, MCS level of current re-transmissions and the initial transmission, and parameters known to both transmission and receiving sides, wherein the parameters are selected from the group consisting of radio frame index, and scrambling code;
        selectively de-puncturing or de-repeating the received sub-packets based on the re-derived rate matching factors; and
        coded symbol combining the selectively de-punctured or de-repeated sub-packets, wherein the coded symbol combining is selected from the group consisting of IR combining, full symbol combining, and partial symbol combining.

13.   A method of link adaptation and code space management comprising the steps of:

selectively turbo puncturing or avoiding puncturing of original transmission bits to generate an encoded packet (EP) h aving t he l owest c ode r ate r equired b y a d esired incremental redundancy (IR);

storing the EP in a hybrid automatic re-transmission request (H-ARQ) memory;

determining the number of Walsh codes available for a desired user, a modulation and coding scheme (MCS) level according to carrier to interference (C/I) feedback values from a desired mobile station, and the radio frame length according to a resource management algorithm;

determining rate matching factors corresponding to the number of available Walsh codes, the MCS level, and the radio frame length;

generating a sub-packet (SP) from the EP based on the rate matching factors; and

transmitting the SP.

14.   The method according to claim 13 further comprising the steps of:

determining a new set of r ate m atching f actors a ccording t he M CS, n umber o f Walsh codes, and radio frame length in response to an unsuccessful SP decoding signal via an acknowledge channel from a receiver;

determining a new SP based on the new set or rate matching factors; and

re-transmitting the new SP.

15.   The method according to claim 14 further comprising the steps of:

receiving the transmitted initial SP and the re-transmitted new SP;

re-deriving the rate matching factors in response to the number of code channels, MCS level of current re-transmissions and the initial transmission, and parameters known to both transmission and receiving sides, wherein the parameters are selected from the group consisting of radio frame index, and scrambling code;

selectively de-puncturing or de-repeating the received sub-packets based on the re-derived rate matching factors; and

coded symbol combining the selectively de-punctured or de-repeated sub-packets, wherein the coded symbol combining is selected from the group consisting of IR combining, full symbol combining, and partial symbol combining.

16.   A link adaptation and code space management system comprising:

a transmission system comprising:

a channel encoder;

a hybrid automatic re-transmission request (H-ARQ) memory operational to store symbols generated via the channel encoder;

a rate matching stage operational to generate rate matching parameters corresponding to the number of available Walsh codes, modulation and code scheme (MCS) level according to carrier to interference feedback values from a mobile receiver, and radio frame length according to a resource management algorithm; and

a receiving system comprising:

a rate matching stage operational to re-generate the rate matching parameters;

a coded symbol combiner stage operational to implement at least one coded symbol combining of the type selected from the group consisting of incremental redundancy combining, full symbol combining, and partial symbol combining; and

a channel decoder operational to decode the coded symbols generated via the coded symbol combiner stage.

17.   The link adaptation and code space management system according to claim 16, further comprising:

a transmission block interleaver operational to selectively interleave transmitted symbols;

a transmission modulator operational to modulate the transmitted symbols;

a receive demodulator operational to demodulate received symbols; and

a receive block interleaver operational to selectively interleave the demodulated symbols.

18.   The link adaptation and code space management system according to claim 16, wherein the channel encoder comprises a turbo encoder.

19.   The link adaptation and code space management system according to claim 18, wherein the channel decoder comprises a turbo decoder.

20.   The link adaptation and code space management system according to claim 16, wherein the receive rate matching stage is operational to re-generate the rate matching parameters based on the number of available Walsh codes, MCS level, and parameters known to both transmission and receiving sides selected from the group consisting of radio frame index, and scrambling code.